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ABSTRACT

The problems of fashioning a theory of language fall into two broad areas: (1) the neurophysiological correlates of language behavior are still little understood, and (2) the enormous amount of data on language behavior that has been gathered by researchers is subject to varying and differing interpretations. In spite of these problems, the theories of J. Piaget and N. Chomsky provide promising leads. Chomsky believes that the language acquisition process develops and unfolds from humans' innate capacity for language; that is, the actualization of language in man stems from a structure-dependent activity. The Piagetian view of the ontogenesis of language holds that cellular growth and development of brain cells plus their interaction with the environment form cognitive functions and establish the basis for language behavior. While both men agree that nothing is knowable unless cognitive organization is there from the start and unless the subject acts in some way on the surrounding world, for Chomsky the environment triggers the ontogenesis of language, and for Piaget the environment not only triggers the development of cognitive functions but also continues to interact until biological maturation occurs. If, therefore, environment plays a key role in the ontogenesis of language, composition teachers must strive to create the proper classroom environment for their students. (JL)

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"Problems of a Theory of Language"

Edward O. Nolte

My role as the first speaker on this panel is to introduce the essential problems involved in fashioning a theory of language. The speakers who follow me will focus on such matters as the history of language theory from the 18th through the 19th century, the Prague School of Linguistics and its developments, and American Structuralism as they relate to the current state of language theory.

The basic problems in fashioning a plenary model of language exists in two broad areas. On the o hand, research on the growth, development, and function of the human br in as they relate to the acquisition of language in children is still incomplete. So a major consideration--the neurophysiological correlates of language behavior--is still little understood. The absence of this empirical data seriously impedes the formulation of such a theory and its absence seriously undermines testing and evaluation procedures that make judgments about the presence or absence of the skill-specifics of language proficiency. On the other hand, there exists an enormous amount of data--let's call it output data-on language behavior gathered by researchers, but it is subject to varying and differing interpretations.

Thus, at the outset of this discussion let me emphasize that the two central concerns necessary for a theory of language are incomplete: the former as to data and the latter as to interpretation. This predicament has put us composition teachers in the position, then, of attempting to work back from language behavior itself to such problems as the ontogenesis of language and the neurophysiological correlates of this process. In fine, I suspect that we are at a stage of language theory formation that approximates the

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taxonomic stage of biologists in the late 17th century.[1] Like them, we have achieved a considerable classification of data, some of it fairly sophisticated. We composition teachers have had our Linneaus; now we need a Darwin.

Despite this current predicament, there are two promising leads in the theories of Piaget and Chomsky and their views are the focus of this paper. But before I consider their perspectives on language, let me review some brain functions and their relationship to language behavior.

The cells in the brain are histologically distinct,[2] and neurobiologists have defined specific areas as the loci for a specific behavior, such as Broca's area for speech functions. However, Eric Lennenberg and David Premack have cautioned against such localization of cognitive functions,[3] because the interrelationships between this area and other brain areas are unclear. However, one anatomist, Norman Geschwind, has advanced the idea that there is indeed one specific feature in the human brain that is crucial for these cognitive functions that we collectively call "language."

In comparing the structure of human brains and simian brains, Geschwind has noted a recently evolved structure,

> The human inferior parietal lobule, which includes the angular and supramarginal gyri, to rough approximation areas 39 and 40 of Brodman. In keeping with the views of many anatomists, Crosby et al., comment that these areas have not been recognized in the macaque. Critchley, in his review of the anatomy of this region, says that even in the higher apes these areas are present in only rudimentary form.[5]

The location of the angular gyri is crucial, because it forms massive connections between auditory and visual cortices. These connections are

crucial for the dynamic patterns of neural activity involved in language generation because they link the visual cortex with the auditory cortex and thus establish intermodal connections for language generation--the semological with the phonological.

Geschwind further notes:

> In man, with the introduction of the angular gyrus region, intermodal associations become powerful. In a sense the parietal association area frees man to some extent from the limbic system. . .
>
> The development of language is probably heavily dependent on the emergence of the parietal association areas since at least in what is its simplest aspect (object naming) language depends on associations between other modalities and audition.
>
> Early language experience, at least, most likely depends heavily on the forming of somesthetic-auditory and visual-auditory associations, as well as auditory-auditory associations.[5]

Despite Geschwind's comments, there is no clear clinical, anatomical, or experimental data that links the dynamic patterns of this region to specific language behavior. Hence, at this point in time the conclusion is that the structuralization of form in the brain cannot be related to the structuralization of function among language behaviors.

Other approaches to understanding this complex neural activity (Language) offer little to explain the acquisition of language or a theory of language as well. The behaviorists, for example, regard language behavior as simply a function stimuli or input. This judgment ignores the fact that language behavior is in many ways an autonomous activity in the sense that its energy is not from stimuli that are behaviorially significant, but from energy stores that are supplied through the body's metabolic activities. Indeed, psychologically

important stimuli trigger and stimulate behavior, but the stimuli are not the architects or the principles by which language behavior operates, nor is language a transform of the input.[6] As Eric Lennenberg has noted

> The cognitive functions of the brain and capacity for language knowledge have an epigenetic history; they are the transforms of earlier, less specialized functions and their correlated physiological processes.[7]

Lennenberg's statement that cognitive functions have an epigenetic history is a good starting place for a discussion of Piaget's and Chomsky's approaches to language theory. But it is also well to bear in mind that even this noted scholar has changed his mind. In his The Biological Foundations of Language (1967), Lennenberg included Chomsky's statement on the innatism of language.[8]

Many regarded this as Lennenberg's endorsement of Chomsky's position that the language acquisition process in man develops and unfolds from man's innate capacity for language. That is to say, the actualization of language in man stems from a structure-dependent activity. In Chomsky's view, the acquisition of language is an "unavoidable contingency" of his genetic endowment.[9]

But in his Foundations of Language Development: A Multidisciplinary Approach, published in 1975, Lennenberg shifted his position. This shift implied that cognitive functions which give rise to language derive from non-specific cellular functions (non-specific association areas of the brain) and their interaction with the environment. Thus, nurture, not nature plays the key role in the ontogenesis of language, a view that parallels Piaget's.

If the environment plays the crucial role in the development of cognitive

functions and language knowledge, then a key piece to the puzzle of language theory is in place. In other words, the Piagetian view of the ontogenesis of language leads to this concept: cellular growth and development of brain cells plus their interaction with the environment form cognitive functions and establish the basis for language behavior.[10] Thus, a relationship betwee structuralization of form (brain cell differentiation) and structuralization of function (language behavior) exists. Only the "how" of this relationship remains to be clarified. "Only" he said.

However, Chomsky and Piaget agree on two fundamental points:

(1) Nothing, including language behavior, is knowable unless cognitive organization is there from the start and (2) Nothing, including language behavior, is knowable unless the subject acts, in one way or the other, on the surrounding world.[11] For Chomsky, the environment triggers the ontogenesis of language. By contrast, for Piaget the environment not only triggers the development of cognitive functions, but also continues to interact until biological maturation occurs.

Thus, the two men differ on the modes, origins, degrees of universality, the constitutive traits, and describable properties that are involved in linking the potentials of the language acquisition process to its actualization in homo sapiens.

For us as composition teachers, these issues may seem futile and remote as we cope with the problems of the "New Literacy." Nonetheless, if environment plays the crucial role in the development of cognitive organization even in the later stages of language knowledge, then one clear injunction seems to follow. We composition teachers need to interact with our subjects

at the earliest possible stage of the composing process--what Young, Becker, and Pike call the preparation stage[12]--to prompt and catalyze the cognitive functions that initiate composition strategies. Our classrooms are environments also, and these environments play, must play, a key role in the language acquisition process.

To summarize, any theory of language that it is to receive its imprimatur from the scientific community must resolve the weighty question of the ontogenesis of language. In the final analysis, the plenary model of language may or may not correspond to the logico-mathematical models of the physical sciences. As the sociolinguists have often noted, language is subject to the vagaries of history, tradition, and social change. Thus, logico-mathematical models would appear to be dysfunctional.

As to the biological model offered by Piaget, I can only conclude, as Chomsky did at the terminus of his debate with Piaget:

> Our ignorance of these matters is profound, But it may be that the results of investigation of such relatively well defined cognitive domains as human language will suggest a useful model for further inquiry.[13]

NOTES

[1]Walker, Percy, The Message in the Bottle (New York: Farrar, Straus and Giroux, 1975), p. 303.

[2]Elizabeth and Eric Lennenberg, Foundations of Language Development: A Multidisciplinary Approach, 2 vols. (New York: Academic Press, 1975); see also Andre Roch Lecours "Myelogenetic Correlates of the Development of Speech and Language," I, 121-135.

[3]Percy, p. 327.

[4]Percy, p. 327.

[5]Percy, p. 326.

[6]E and E Lennenberg, II, 234.

[7]E and E Lennenberg, II, 237.

[8]Eric Lennenberg, Biological Foundations of Language (New York: John Wiley and Sons, Inc., 1967). For an overview of the inadequacies of all language theories, see Martin Atkinson's Explanations in the Study of Child Language Development (Cambridge, England: Cambridge University Press, 1982).

[9]Massimo Piatelli-Palmarini, trans. Language and Learning (Cambridge, Massachusetts: Harvard University Press, 1980), p. 52.

[10]Palmarini, p. 53.

[11]Palmarini, p. 53.

[12]Richard D. Young, Alton L. Becker, Kenneth L. Pike, Rhetoric: Discovery and Change (New York: Harcourt, Brace, and World, Inc., 1970), p. 119.

[13]Palmarini, p. 52.